

Groundbased Studies of Spacecraft Glow and Erosion
Caused by Impact of Oxygen and Nitrogen Beams*

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To simulate surface reactions in the space environment we have developed a groundbased facility that produces a very high flux (10^{14} to 10^{16} /cm²/s) of low energy (2-20 eV) neutral atoms and molecules. The neutral beams are created using a novel method involving neutralization and reflection of ions from a biased limiter, where the ions are extracted from a toroidal plasma source. We present spectra of emission due to beam-solid interactions on targets of Chemglaze Z-306 optical paint and Kapton. We measured erosion yields for carbon and Kapton targets with low energy (~ 10 eV) nitrogen and oxygen beams. The reaction rates and surface morphology for the erosion of Kapton are similar to those measured in experiments on STS-5.

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